BC Environment

INVENTORY OF LEWIS'S WOODPECKER POPULATION AND HABITAT IN THE EAST KOOTENAY

by
John M. Cooper
and
Suzanne Beauchesne

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Wildlife Working Report No. WR-100

March 2000

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British Columbia, Canada's most westerly province, has a bounty of biological diversity. British Columbia's snowclad peaks, rain-drenched forests, arid grasslands, all sizes of rivers, lakes, and wetlands, and a long and rugged coast provide habitats for more species of living organisms than are found anywhere else in Canada. However, this very diversity means that there is much to be discovered about these organisms — their distribution, abundance, habitat requirements, and interrelationships with their environment. Increasing our knowledge of this biodiversity will help us with the complex task of sustainably managing our land and waters.

In 1992, the Provincial Government initiated a co-operative biodiversity research program with funding from the Corporate Resource Inventory Initiative, the British Columbia Ministries of Forests (Research Branch), Environment, Lands, and Parks (Wildlife and Habitat Protection Branches), and Tourism and Culture (Royal B.C. Museum), and the Forest Resource Development Agreement (FRDA II).

In 1995, the Ministry of Forests Research Branch and the Ministry of Environment, Lands and Parks developed a biodiversity research and extension strategy, with the assistance of the provincial research community. This strategy was presented to Forest Renewal BC (FRBC), who provided funding for a program beginning in 1995. The goal of the extension component of this program is to extend information to scientists, resource managers, and the public through biodiversity publications. These publications are intended to increase awareness and understanding of biodiversity, promote the concepts and importance of conserving biodiversity, and communicate provincial government initiatives related to biodiversity. We hope that they will be used as tools for the conservation of British Columbia's rich, living legacy.

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INVENTORY OF LEWIS'S WOODPECKER BREEDING POPULATION AND HABITAT IN THE EAST KOOTENAY

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BRITISH COLUMBIA

Ministry of Environment, Lands and Parks
Wildlife Branch
Victoria, B.C.

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March 2000

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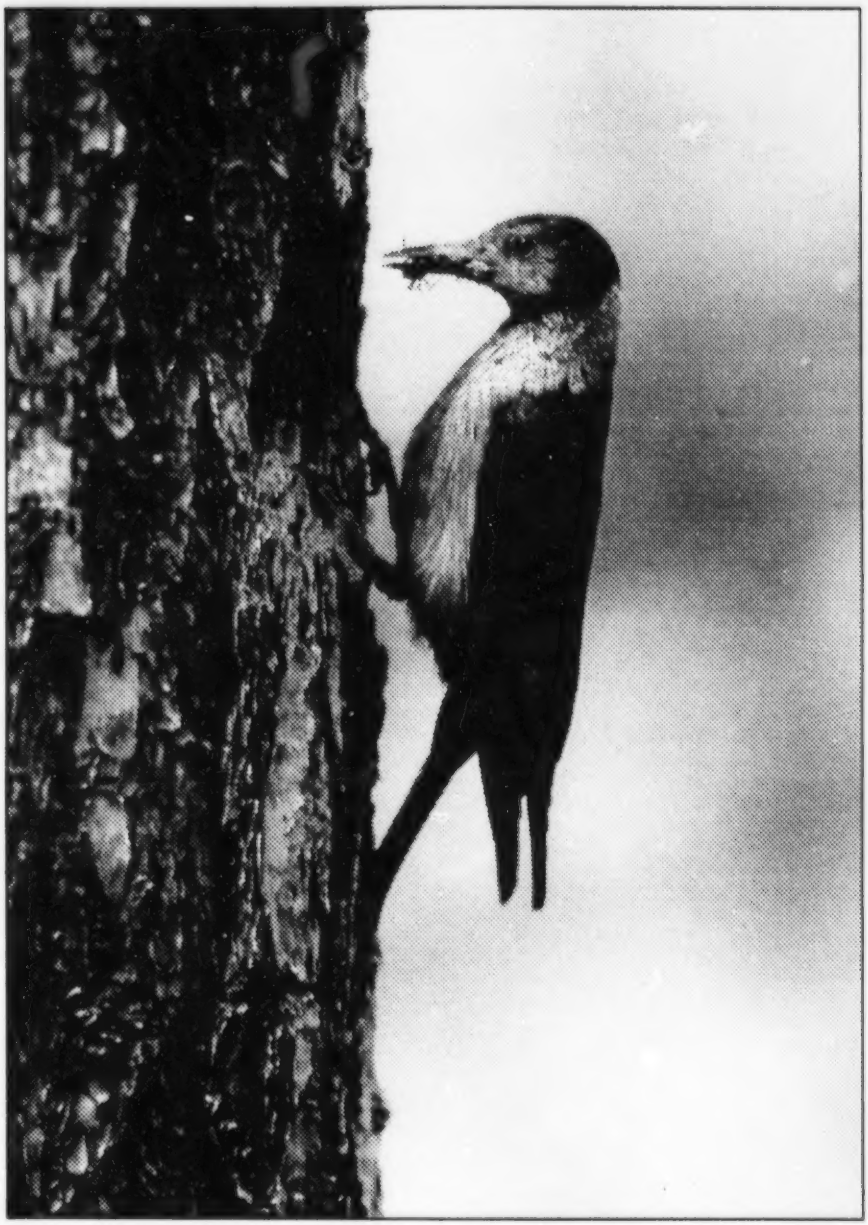

Lewis's Woodpeckers have strikingly colourful plumage at close range. Their pinkish bellies, reddish face, and greenish-black wings and back are diagnostic. In flight, this woodpecker appears dark, and its flight pattern suggests that of an American Crow or Clarke's Nutcracker than other woodpeckers. This adult was feeding young at a nest near Newgate in 1998. (Mark Nyhof photo).

ABSTRACT

The East Kootenay Trench was surveyed for nesting Lewis's Woodpeckers (*Melanerpes lewis*) in June and July of 1997 and 1998. Forty-seven active nests were found the first year, and 85 were found the following year. These nests occurred in four habitat types: burned coniferous forest, open mature ponderosa pine forest, range land with isolated veteran ponderosa pines, and riparian cottonwood. Distribution of nests found was clumped, perhaps suggesting that preferred habitat was not randomly distributed. Nest trees were mainly burned ponderosa pine and Douglas-fir snags, large and dead veteran ponderosa pines, or live mature ponderosa pines; although western larch, black cottonwood, trembling aspen, paper birch, and utility poles were also used. Most nests were on Crown land, but in two areas (Wycliffe and Fairmont) nests were found predominantly on private land. The authors estimate that 100 to 150 pairs nest in the East Kootenay Trench, and suggest that good habitat is rare, that concentrations of nesting birds occur in burns, and that enhancement of habitat is feasible.

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The authors thank the Habitat Conservation Trust Fund for funding this project. Special thanks to Myke Chutter (MELP) for his encouragement and administrative support. Cam Gillies and Mark Nyhof cheerfully worked long but happy days looking for nests, recording data, and solving problems. Dianne Cooper and Jocelyn Cooper found some Lewis's Woodpeckers in unusual places. Many thanks to dozens of local naturalists and residents, and government personnel who took an interest in this project. A great overview of the study area was provided by Bill Warkentin (MELP) who drove us through most of the potential habitat in the East Kootenays, showed us the best accesses to remote sites, and probably saved us many days of time. Also thanks to Bill for his historical perspective on habitat changes in the East Kootenay.

Reviews of earlier drafts by Myke Chutter, Ted Antifeau, Bill Warkentin, Dave Low, and Syd Cannings greatly improved the manuscript.

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TABLE OF CONTENTS

1 INTRODUCTION 1
2 OBJECTIVES 1
3 METHODS 1
4 RESULTS 2
4.1 Population Estimate 5
4.2 Habitat 6
4.3 Land Status 9
4.4 Extent of Habitat 10
4.5 Public Reaction to the Project 10
5 DISCUSSION 12
5.1 Population Estimate 12
5.2 Habitat 12
5.2.1 The role of fire 12
5.2.2 Riparian habitat 15
5.3 Land Status 15
5.4 Conservation 15
5.5 Summary 15
6 CONSERVATION RECOMMENDATIONS 16
6.1 General Recommendations 16
6.2 Wildlife Habitat Areas 17
7 LITERATURE CITED 17

LIST OF FIGURES

Figure 1. Location of 47 Lewis's Woodpecker nests found in the East Kootenay Trench, 1997 3
Figure 2. Location of 85 Lewis's Woodpecker nests found in the East Kootenay Trench, 1998 4

LIST OF TABLES

Table 1. General habitats used by nesting Lewis's Woodpeckers, 1997 6
Table 2. General habitats used by nesting Lewis's Woodpeckers, 1998 7
Table 3. Lewis's Woodpecker nest tree characteristics, 1997 and 1998 8
Table 4. Estimate of amount of habitat used by nesting Lewis's Woodpeckers in the East Kootenay Trench, 1998 10
Table 5. Area (ha) of stands with leading ponderosa pine by age range in the Invermere and Cranbrook Timber Supply Areas, 1998 12

LIST OF APPENDICES

Appendix 1. Key persons contacted for information on Lewis's Woodpeckers in the East Kootenay 19
Appendix 2. Poster that was placed in government offices, community billboards, etc 20
Appendix 3. Conservation Data Centre Field Observation Form (Animals) 21
Appendix 4. Wildlife/Danger Tree Field Assessment Data form 23
Appendix 5. Ecosystem Field Form 24
Appendix 6. Summary of Lewis's Woodpecker nest site general location, habitat, and nest tree characteristics, 1997 25
Appendix 7. Summary of Lewis's Woodpecker nest site general location, habitat, and nest tree characteristics, 1998 28

1 INTRODUCTION

The Lewis's Woodpecker (*Melanerpes lewis*) is an uncommon woodpecker of dry, open forests in the southern interior of British Columbia (Campbell et al. 1990), where it reaches the northern limit of its range in North America (American Ornithologists' Union 1983). A recent status report (Cooper et al. 1998), has suggested that populations are declining province-wide and, indeed, breeding populations have disappeared from the coast of British Columbia (Campbell et al. 1990). Consequently, the Lewis's Woodpecker is on the provincial Blue List of vulnerable species (B.C. Wildlife Branch 1999).

This woodpecker requires open coniferous and/or deciduous forest with large diameter dead or dying trees for breeding habitat (Sousa 1983). The "openness" requirement of habitat is related to behaviour (foraging by fly-catching in open spaces), and food supply (dense grassy/shrubby understories in open stands produce a greater abundance of flying insects). Nest trees are usually Class 2-7 Wildlife Trees (Post et al. 1996). In British Columbia, most pairs build nests in large, decayed ponderosa pine or black cottonwood (Campbell et al. 1990) and tend to breed in valley bottoms and foothills rather than on mountain slopes.

The status of the Lewis's Woodpecker is relatively well known in the Okanagan/Thompson region (e.g., Cannings et al. 1987, Campbell et al. 1990), but the populations in the East Kootenay Trench, Fraser River Basin, and Pavilion Ranges have been poorly documented (Cooper et al. 1998). The Conservation Data Centre's Element Ranking Form (Cooper 1992), which was used to justify placing the Lewis's Woodpecker on the Blue List, recommended that inventory of the East Kootenay Trench population was needed to adequately assess the provincial status. Other recommendations in that report include an assessment of habitat used for nesting and the impact of logging and silviculture of ponderosa pine on breeding densities.

This HCTF project involved the inventory of Crown Lands (mainly) in the Ponderosa Pine/Interior Douglas-fir biogeoclimatic zones in the East Kootenay Trench for nesting Lewis's Woodpecker, an assessment of Wildlife trees used for nesting, and an assessment of available habitat over a two-year period.

The primary rationale for the project includes:

1. Populations are poorly documented in the East Kootenay.
2. Nest tree characteristics are poorly documented in British Columbia, including the East Kootenay.
3. No intensive inventory or research has been conducted on the Lewis's Woodpecker in British Columbia. The East Kootenay trench was suspected of having significantly more breeding pairs than recent data suggest.

The two-year project allowed concentrations of breeding pairs to be identified, nest tree characteristics to be described, and the extent of available habitat in the East Kootenay Trench to be assessed.

2 OBJECTIVES

The objectives of this project were to:

1. locate and map nest trees used by Lewis's Woodpeckers;
2. describe characteristics of Wildlife Trees used for nesting (tree species, Wildlife Tree class, tree height, dbh, cavity height and orientation, and use of tree by other wildlife species) and completion of Ecosystem Field forms for nest tree sites, which describes features of the habitat, including vegetation around nest trees;
3. acquire data on regional population size;
4. assess availability of suitable habitat in the East Kootenay Trench; and
5. recommend measures to conserve/enhance habitat for nesting Lewis's Woodpecker;

3 METHODS

Late May 1997

After notification from HCTF that the project would be funded, naturalists and biologists with knowledge of birds in the East Kootenay were contacted for information on possible nesting areas for Lewis's Woodpecker; 24 people were consulted during this process (see Appendix 1). Two assistant biologists were hired: Cam Gillies (B.Sc.) and Suzanne Beauchesne (B.Sc.).

June – July 1997

Field work commenced on 5 June 1997. Two areas were surveyed: 1) from Canal Flats north and 2) from the

USA border north to Skookumchuck. The first tasks were to: 1) contact and visit local MELP, Parks Canada, and MOF biologists and naturalists; 2) distribute posters (Appendix 2) which requested information on Lewis's Woodpeckers to bulletin boards at local restaurants, gas stations, offices etc. throughout the study area; and 3) submit a news article to the Kootenay Advertiser (a newspaper distributed to all households in the Kootenay from Creston north to Golden) and in the Valley Echo (local Invermere paper).

A "Lewis's Woodpecker Hotline" was established on the author's (Cooper) cell phone based at the Kimberley house. This telephone line accepted calls from people responding to the news article and posters. Beauchesne attended a meeting of the Rocky Mountain Naturalists in Cranbrook and made them aware of the project. One of the assistant biologists talked to knowledgeable people in Invermere.

Each assistant biologist spent 20 field days searching for nest sites; Beauchesne completed her work on 30 June, Gillies on 10 July. A third assistant biologist, Mark Nyhof, spent one week searching for nests from 26 June to 4 July. Cooper worked 12 field days on this project, from 5 June through 10 July (coordinating and training assistants, visiting local biologists/naturalists, searching for nests). Myke Chutter (Contract Monitor) spent one day visiting the study site (6 July).

Areas searched for nests were priorized based on historical information on nesting areas, new information acquired from local naturalists/biologists, and our personal knowledge of the study area. In general, surveys were conducted in open stands of mature ponderosa pine, riparian black cottonwood, and burned areas with snags (potential nest trees). In addition, all sites reported by the public were visited.

Data on nest tree characteristics and habitat characteristics around nest trees were recorded. Data collected included all information required by the Conservation Data Centre (Appendix 3), Wildlife Tree Habitat Rating (Appendix 4), and Ecosystem Field Form (Appendix 5).

June – July 1998

Few changes were made to the overall plan for the 1998 field season. The area was again divided between the same two assistant biologists, with the boundaries established 1997. Both biologists spent 20 days in the field searching for nests. In 1997, it was noted that the probability of detection of nesting activity increased later in the season, therefore the 1998 season was delayed, commencing on June 22, and ending on July 16. Mark Nyhof returned to spend one week in the area (July 4 to July 11), visiting both the northern and southern regions. Cooper worked for 12 days coordinating the project, meeting with MELP biologists and searching for nests. Myke Chutter (Contract Monitor) again spent one day visiting the study site.

In 1998, search priority was based on success in 1997 (all 1997 nest sites were revisited) and the biologists knowledge of the region's habitat quality, relative to the nest site preference of Lewis's Woodpeckers. Furthermore, an effort was made to visit those areas which, due to time constraints, had not been searched in 1997. To increase efficiency, areas which had not been productive in 1997, and which were thought to have poor Lewis's Woodpecker habitat, were not revisited in 1998.

The extent of ponderosa pine forest in the East Kootenay Trench was determined by using figures provided in Timber Supply Reviews for the three Timber Supply Areas (MOF 1998).

4 RESULTS

In 1997, the discovery of 47 nests exceeded the primary author's expectations by about 50%, and was considered extraordinary by R. Wayne Campbell (MELP Biologist, pers. comm.). In 1998, 85 active nests were found: 22 of these were in cavities that had been used in 1997, 3 were in trees in which a different cavity had been used in 1997 and 60 were new. Of the 47 nests occupied in 1997, 60% were reoccupied in 1998. Nests were found from Newgate, near the International Boundary, north to near Invermere. In 1997, most nests were found in three general areas: Newgate, Wycliffe, and Lake Windermere (Figure 1). In 1998, in addition to these three important areas, the Findlay Creek burn, west of Canal Flats (not surveyed in 1997) was found to contain a dense pocket of nest sites (Figure 2).

In 1998, in addition to the 85 nesting pairs of Lewis's Woodpeckers, 3 pairs and 2 individual birds were observed for which no nest could be located. These birds may have been non-breeders, or birds whose nests had failed. Evidence of predation by bears on cavities close to the ground is common in the Newgate area, and at least one nest, which had been recently predated, was suspected to have been a Lewis's Woodpecker nest (based on eggshell characteristics, use of this snag by Lewis's Woodpecker in 1997, and the presence of three 'non-nesting' adult birds).

It was hoped that birds could be captured and banded in order to provide additional data on repeat use of nest trees and better estimates of populations. However, because this woodpecker is extremely wary, capture of adults is very time-consuming. In 1997, after attempting to capture birds at three different nests with

Figure 1. Location of 47 Lewis's Woodpecker nests in the East Kootenay Trench, 1997.

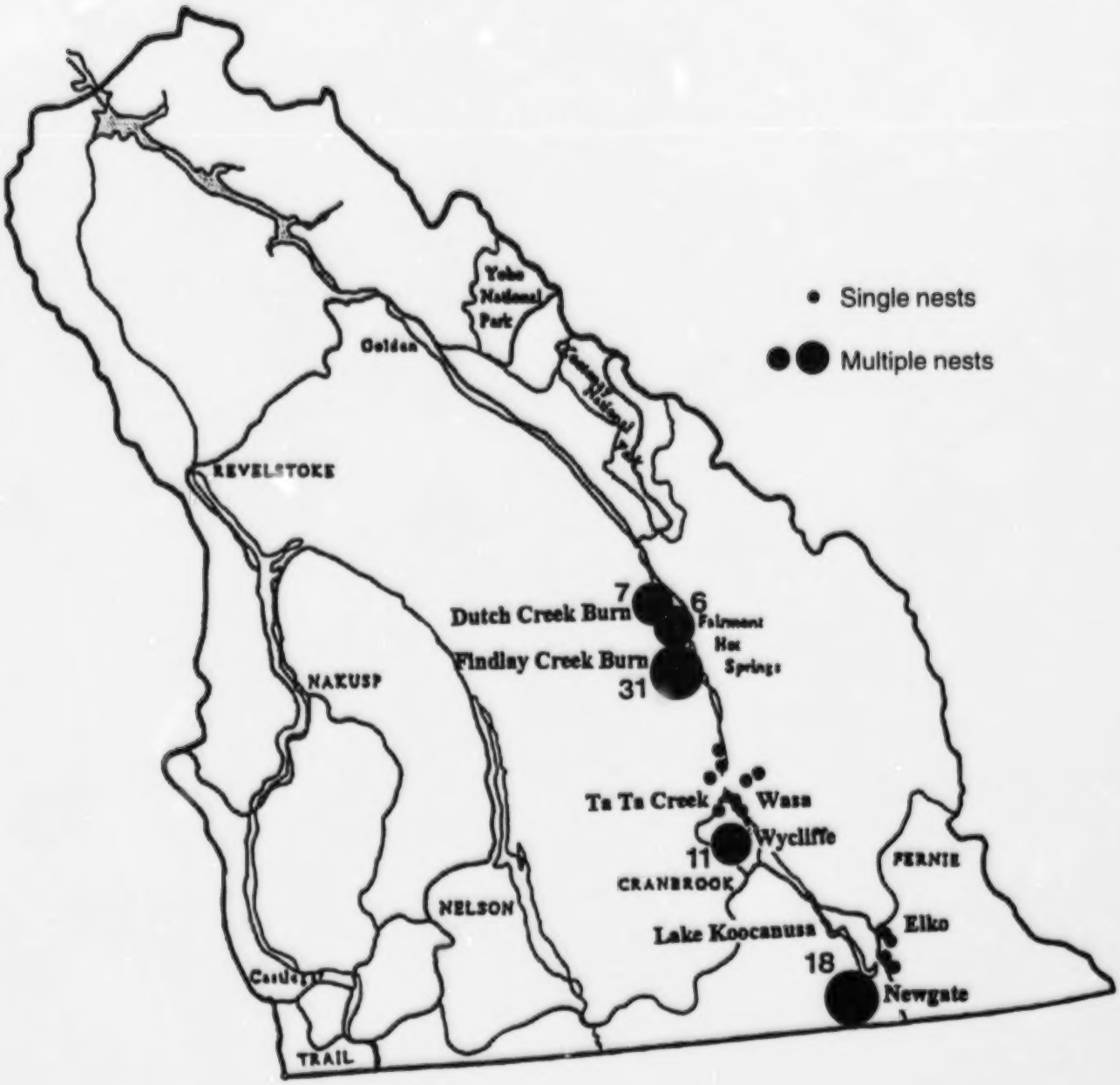


Figure 2. Location of 85 Lewis's Woodpecker nests in the East Kootenay Trench, 1998.

no success, the decision was made to invest time in finding nests, rather than attempting to capture birds. No attempts were made to capture birds in 1998.

4.1 Population Estimate

The large, dense population (31 pairs) found in the Findlay Creek Burn represents the majority of the increase in nests found in 1998, compared to 1997. This burn is relatively large, but most nests were found in a small portion of the burn. Other areas surveyed for the first time in 1998 did not yield a significant number of new nests. Over the course of the two year study, we believe the most productive areas were well-sampled and it seems unlikely that there are additional pockets of large numbers of breeding pairs, such as was found in the Findlay Creek Burn. However, some individual nests were likely not detected in some areas visited if nesting occurred earlier (one known nest was vacated by July 10) or later (courting was observed June 23, while

Even relatively short wildlife trees such as this 5 m tall western larch in the Findlay Creek Burn are used for nest sites by Lewis's Woodpeckers. Burns create suitable nesting habitat at higher elevations than this woodpecker would normally use, extending suitable habitat in some locations to upper parts of the Interior Douglas-fir biogeoclimatic zone. (Cameron Gillies photo)

a nearby pair was already feeding) than average. Nests may also have been overlooked in areas which were visited when weather was not optimal, as nest detection was correlated to weather, with adults being more active on sunny days. Isolated nesting pairs were also undoubtedly missed throughout the study area.

Given that the biologists surveyed the best habitat available, found 85 active nesting pairs and 3 non-nesting pairs in a single nesting season (1998), and likely missed isolated pairs throughout the study area, we estimate that the breeding population in the East Kootenay Trench is in the range of 100-150 pairs.

4.2 Habitat

Nests were found only in the Ponderosa Pine (53% in 1997, 38% in 1998) and Interior Douglas-fir (47%, 62%) biogeoclimatic zones (Table 1 and Table 2). Nest trees occurred in three broad habitat classes (Lea and Harcombe 1992): Ponderosa Pine (59%, 37%), Douglas-fir/Ponderosa Pine (28%, 53%), and Riparian (13%, 10%). Nesting habitat was also classified in a more descriptive manner: recent burns (38%, 59%), grassland with scattered trees (25%, 8%), open forest (23%, 19%), and riparian (13%, 13%; Table 1 and Table 2). Of those nests not found in burns, almost all were within the Ponderosa Pine Biogeoclimatic Zone.

Over the two year study period, nests were found at elevations between 740 m and 1160 m. In 1997, most (79%) were found along the valley bottoms between 750 m and 850 m (Appendix 6 and Appendix 7) and only 2 nests were found above 1000 m. However, the discovery in 1998 of 31 nests in the Findlay Creek Burn, added many higher altitude nests, with 18 found above 1000 m. All nests above 1000 m were in burns.

Most nests, both years, were found in ponderosa pine (53%, 40%) or Douglas-fir (23%, 35%) trees or snags, but were also in found black cottonwoods (9%, 4%), trembling aspen (6%, 7%), paper birch (4%, 5%), and power poles (4%, 4%). In 1998, an additional nest tree species was added with three nests found in western larch (4%). Nest trees tended to be large (>50 cm dbh) and old, and decayed or dead. Wildlife tree

Table 1. General habitats used by nesting Lewis's Woodpeckers, 1997.

	All Nest Trees	Ponderosa Pine	Douglas-fir	Black Cottonwood	Trembling Aspen	Paper Birch	Power Pole
Biogeoclimatic zones							
Ponderosa Pine	25	18	4	2	0	0	1
Interior Douglas-fir	22	7	7	2	3	2	1
Broad habitat class							
Black cottonwood riparian	6	0	0	4	0	2	0
Ponderosa pine	30	22	4	0	0	0	2
Douglas-fir/Ponderosa pine	13	3	7	0	3	0	0
General habitat description							
Riparian	6	0	0	4	0	2	0
Grassland**	12	10	0	0	0	0	2
Open forest***	11	11	0	0	0	0	0
Recent burn* (grassland with snags)	18	4	11	0	3	0	0

* <30 years

**only a few scattered trees

***open stand or copse of mature or old trees

Table 2. General habitats used by nesting Lewis's Woodpeckers, 1998.

	All Nest Trees	Ponderosa Pine	Douglas-fir	Western Larch	Black Cottonwood	Trembling Aspen	Paper Birch	Utility Pole
Biogeoclimatic zones								
Ponderosa Pine	32	18	8	0	1	4	0	1
Interior Douglas-fir	51	16	22	3	2	2	4	2
Broad habitat class								
Black cottonwood riparian	8	0	0	0	3	1	4	0
Ponderosa pine	31	18	8	0	0	4	0	1
Douglas-fir/Ponderosa pine	44	16	22	3	0	1	0	2
General habitat description								
Riparian	11	3	0	0	3	1	4	0
Grassland**	7	5	0	0	0	1	0	1
Open forest***	16	8	3	0	0	4	0	1
Recent burn* (grassland with snags)	49	18	27	3	0	0	0	1

* <30 years
**only a few scattered trees
***open stand or copse of mature or old trees

decay classifications (Backhouse 1993) for nest trees ranged from Class 1-7, but most were Class 2-5. There were noticeable differences between ponderosa pine and Douglas-fir nest trees in wildlife tree class (decay class), tree height, cavity height, and presence of bark (Table 3). For example, nests in Douglas-firs were always in dead trees in burns, and those snags were usually in a more advanced stage of decay than those in ponderosa pines or other trees.

Fire plays an obvious role in creating suitable nesting habitat. Many nests (38% in 1997, 59% in 1998) were found in areas where high-intensity stand-destroying burns had occurred. All these areas were in burns <27 years old, and had only remnant snags or an occasional live tree standing. However, if nests found in grasslands with scattered trees or in open ponderosa pine forest, which are habitats maintained in part by repeated low-intensity burns (Province of B.C. 1995) are included, then all nests not found in riparian areas or in agricultural habitats were in areas influenced by recent or repeated fire.

The single most exciting discovery in 1997 was of a tree near Newgate with 3 pairs of Lewis's Woodpecker nesting. The tree was a mature, but not large, live ponderosa pine. Nest cavities had been excavated in a split in the bark that spiraled down the trunk, probably the result of a lightning strike. Multiple pairs nesting in a single tree have not previously been reported in British Columbia, although the Lewis's Woodpecker is known to nest semi-colonially in southern parts of its range (Tobalske 1997). In 1998, the top two cavities of this tree were again used by two pairs of Lewis's Woodpecker. The bottom cavity, however, housed an American Kestrel family. In 1998, less than a kilometre away, a similar nest tree (live, mid-size, Class 2 ponderosa pine) was found with two Lewis's Woodpecker pairs nesting. In addition, a tree with 2 pairs of nesting Lewis's Woodpeckers was observed in the Similkameen River valley during 1997/1998 (M. Chutter and J. Cooper, unpubl. data).

In 1998, the most interesting nest site was one near Wycliffe where a nest with nearly-fledged young was found in a 1.6 m high Douglas-fir stump. The cavity was only 60 cm above ground and is the lowest nest cavity height reported for the Lewis's Woodpecker (Bock 1970; Campbell et al. 1990; Tobalske 1997). In 1997, a pair had nested 60 m from this site, in a cavity 12 m up

Table 3. Lewis's Woodpecker nest tree characteristics, 1997 and 1998.

Nest Tree	n	Tree ht (m) Range	dbh (cm) Range	Cavity ht (m) Range	Bark (%) Range	WLT Class* Range
ponderosa pine						
1997	25	17 ± 6.1 5.0-25	61 ± 24.5 34-120	9.1 ± 4.1 2.5-1.8	79 ± 338 0-100	3 ± 1.6 1-7
1998	34	15.5 ± 6.4 2.4-28.0	59.2 ± 21.9 34-115	9.1 ± 3.9 2.0-17.5	86 ± 23 15-100	3.5 ± 2.1 1-7
Douglas-fir						
1997	11	8 ± 3.5 2.4-13	47 ± 15.0 31-71	5.4 ± 2.43 1.9-10	± 1-90	6 ± 1.2 4-7
1997	30	8.5 ± 4.5 1.6-20.0	48.3 ± 13.6 28-85	6.2 ± 4.1 0.6-18.5	67 ± 37 0-99	6.2 ± 1.3 2-7
birch/aspen						
1997	5	13.4 6-20	36 24-66	7.7 5.5-13	96 90-99	4 1-6
paper birch						
1998	4	12.0 ± 1.4 11.0-14.0	47.5 ± 13.4 34-66	7.8 ± 1.9 5.0-9.0	97.8 ± 1.9 95-99	3.0 ± 2.0 2-6
trembling aspen						
1998	6	10.6 ± 3.7 4.5-15.0	34.2 ± 11.3 20-48	4.8 ± 2.8 2.5-10.0	100 100	1.7 ± 0.5 1-2
black cottonwood						
1997	2	22	58	10.5	97	2.5
1998	3	22 20-24	71 ± 33.0 50-109	11.7 ± 6.0 6.0-18.0	99 99	2.3 ± 0.6 2-3
western larch						
1997	0					
1998	3	13.3 ± 7.4 5-19	47 ± 9.9 39-58	12.1 ± 7.8 3.3-18.0	56.7 ± 50 0-95	6.0 ± 1 5-7
all nest trees						
1997	43	13.7 ± 7.00 2.4-25	53 ± 22.6 24-120	7.8 ± 3.8 1.9-18	71 ± 34.0 0-100	3.6 ± 2.07 1-7
1998	80	12.6 ± 6.3 1.6-28	52 ± 19.1 20-115	8.0 ± 4.5 0.6-18.5	75.1 ± 35.2 0-100	4.5 ± 2.3 1-7

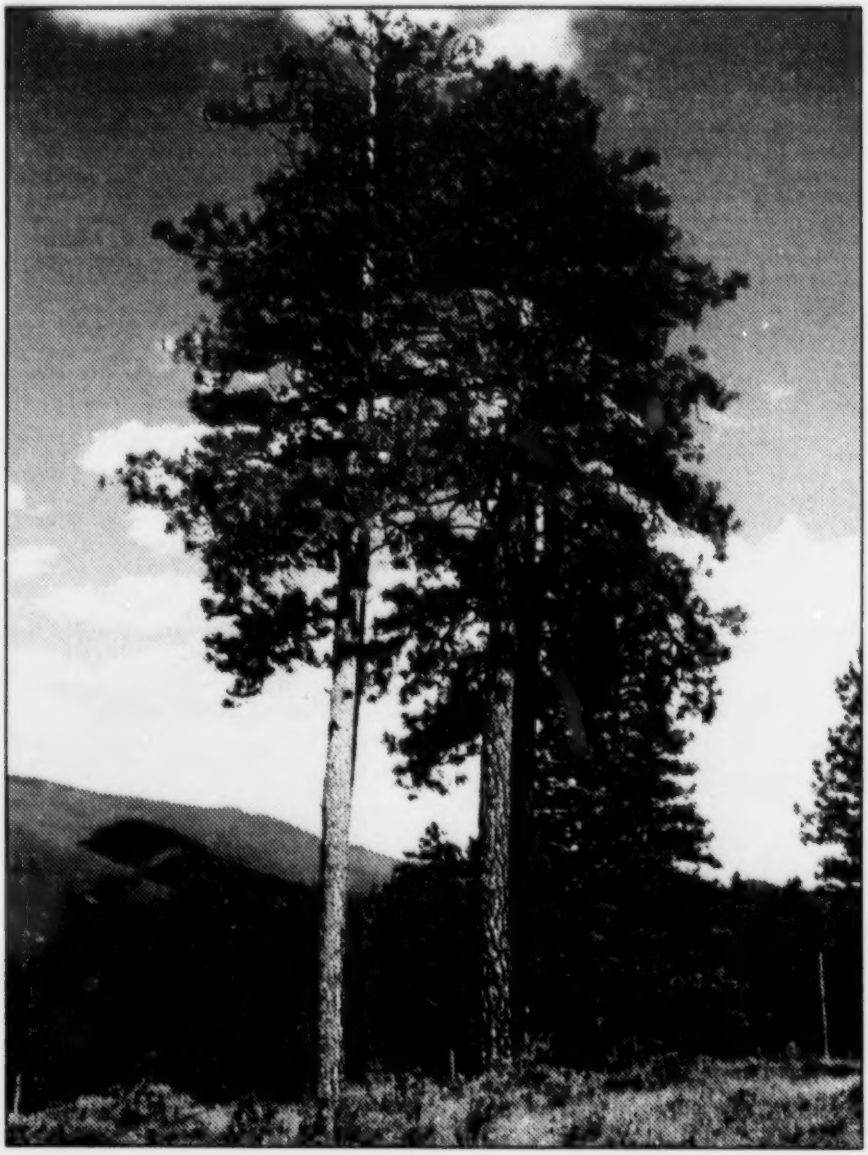
* Wildlife Tree Class

in a 16 m tall dead ponderosa pine. It is not known if the same pair was involved but, in any case, an apparently lower quality nest cavity was used in 1998.

4.3 Land Status

Nests were found on both private land [16 nests (34%) in 1997, 22 nests (26%) in 1998], and Crown land [29 (64%), 63 (74%)]. In 1997, one nest was found on Indian Reserve land, however, the nest tree had either fallen or been cleared for development by 1998. All nests found at Fairmont (4 in 1997, 6 in 1998), and all but 2 found at Wycliffe (8 in 1997, 10 in 1998), were on private land.

Most of the nests found on Crown land were on lands that are being managed for a variety of wildlife, cattle range and timber values, but ungulate winter range



Three pairs of Lewis's Woodpeckers nested in the ponderosa pine with a dead top, near Newgate in 1997. This tree had been struck by lightning, splitting the bark in a spiral pattern down the trunk. All three nest cavities were excavated in this split. In 1998, two pairs of Lewis's Woodpeckers and one pair of American Kestrel nested in these cavities. (John M. Cooper photo).

Table 4. Estimate of amount of habitat used by nesting Lewis's Woodpeckers in the East Kootenay Trench, 1998.

Area	Timber Supply Area	Estimated ha Used
Wycliffe	Cranbrook	1200
Newgate	Cranbrook	1100
Findlay Creek	Invermere	1000
Dutch Creek	Invermere	600
Wasa-Ta Ta Creek	Cranbrook	600
Fairmont	Invermere	300
Elko	Cranbrook	300
TOTAL		5100

seems to be the highest wildlife priority (based on various signs posted). For example, all the nests near Newgate were on Crown land and appeared to be mainly within the Strauss Wildlife Reserve. Most of the nests in the Dutch Creek Burn appear to be within the Windermere Wildlife Reserve.

4.4 Extent of Habitat

The amount of habitat that is currently being used by nesting Lewis's Woodpeckers was estimated by counting the number of km2 (100 ha) UTM grids which contained at least 1 nest in 1997 or 1998 (Table 4) and assuming that the 100 ha within the grid was used. Habitat or forest types were determined using a combination of 1:50,000 topographic maps, biogeoclimatic zones, forest cover maps, and fire history (provided by J. Parminter, MoF). Of the 5100 ha estimate, 1900 ha were burned Douglas-fir stands (Findlay, Dutch, Elko), 1600 were in rural/ agricultural areas with remnant veteran ponderosa pines (Wycliffe, Wasa-Ta Ta Creek), 1100 were in burned ponderosa pine stands (Newgate), and 500 were in riparian areas (Wycliffe, Fairmont).

Near Wycliffe, Wasa, and Ta Ta Creek almost all habitat is dependent on the presence of large dead or decayed ponderosa pine nesting trees (a very rare habitat feature). At Findlay Creek, Dutch Creek, and Elko almost all habitat is associated with stand-destroying burns that have left numerous snags for nesting. The only location where nesting occurs in open, repeatedly burned ponderosa pine forest is near Newgate.

The East Kootenay Trench runs more or less north/ south through three Timber Supply Areas (TSAs). Estimates of forest area with ponderosa pine as the leading tree species in the three TSAs are Golden – 0 ha, Invermere – 5448 ha, and Cranbrook – 21,185 ha (Ministry of Forests 1998) (Table 5). These estimates are for Crown land only, and do not include stands on private land. Of the stands on Crown land, 17% (3611 ha) in the Cranbrook TSA and 21% (1143 ha) in the Invermere TSA are mature or older (>120 years).

Considerable but unknown amounts of ponderosa pine occur on private lands in the East Kootenay Trench. Most if not all of the very largest (> 80 cm dbh) snags that were used for nesting were on private lands. Most of these trees were at the edge of open grasslands or farmlands.

4.5 Public Reaction to the Project

Reaction to the project was very positive. All persons approached for information were very cooperative. Most private land owners were enthusiastic about granting permission to enter their property, and were pleased that someone was interested in "their woodpecker". The majority were already aware of the habitat value of their wildlife trees, although they were unaware specifically which species used their tree.

Very large and dead ponderosa pines provide very rare nesting habitat for Lewis's Woodpeckers on private lands where most commercially larger trees have been removed. This nest tree, near Wycliffe, is one of only a few remnant old-growth ponderosa pines remaining in the uplands between Marysville and the Kootenay River, most of which were used by nesting Lewis's Woodpeckers. (Suzanne Beauchesne photo).

Table 5. Area (ha) of stands with leading ponderosa pine by age range in the Invermere and Cranbrook Timber Supply Areas (Ministry of Forests 1998).

Timber Supply Area	Age Range									
	1-20	21-40	41-60	61-80	81-100	101-120	121-140	141-250	250+	Total
Invermere	176	683	674	2086	533	144	68	1083	0	5448
Cranbrook	156	269	2509	5817	6478	2344	1178	2421	12	21185
Totals	332	952	3183	7903	7011	2488	1246	3504	12	26633

In 1997, the Lewis's Woodpecker Hotline logged 26 calls from local people with possible sightings. All callers appreciated talking about woodpeckers and receiving information. Local newspapers were happy to place a story about the work. The hotline revealed one nest on private property that would otherwise not have been found, as it was not visible from public land. It also resulted in several tips for nests which had already been found, indicating that there were a number of people in the area that were able to recognize, and were looking out for, Lewis's Woodpeckers. The lack of new nest sites, compared to known nest sites, reported by the general public increased confidence that a significant percentage of nests in the area were being found.

Members of the Columbia Valley Naturalists helped search for nests for 3 days in 1997 and 1998.

5 DISCUSSION

5.1 Population Estimate

More breeding Lewis's Woodpeckers were found in the East Kootenay Trench than expected. Cooper et al. (1998), using data from pre-1991, estimated that 24 pairs would occur in the East Kootenay Trench from the International Boundary north to Invermere. Since 85 nests were found in 1998 and most areas with good habitat were believed to have been searched, a more reasonable estimate may be 100-150 pairs. Numbers likely fluctuate from year to year, or over a period of years, as populations respond to changing conditions provided by new burns or aging older burns.

5.2 Habitat

The Lewis's Woodpecker occurs locally in the East Kootenay Trench in three natural habitats which are relatively rare: 1) open, mature ponderosa pine stands; 2) burned ponderosa pine and Douglas-fir stands; and 3) black cottonwood riparian stands. Concentrations of nesting birds in natural habitats were found along the west shore of Lake Koocanusa near Newgate, in the Dutch Creek Burn near Lake Windermere, and in the Findlay Creek Burn near the south end of Columbia Lake. Other concentrations of nesting pairs were found in agricultural (in the vicinity of Wycliffe) or modified (Fairmont Golf Course) habitats.

Although no attempt was made to study diet, availability of food (insects) is a critical component of suitable habitat (Bock 1970; Sousa 1983). Suitable habitat tends to include a brushy understorey that provides abundant insects and very open forest with snags, or grasslands with scattered trees, which provide perches used while foraging (Sousa 1983).

All nests were found in the Ponderosa Pine or Interior Douglas-fir biogeoclimatic zones. The upper limit of the IDF, about 1450 m (Meidinger and Pojar 1991) is higher than the Lewis's Woodpecker appears to nest in British Columbia. The highest elevations for nests were 1100 m in 1997 and 1110 m in 1998. In the Dutch Creek Burn and Findlay Creek Burn, a very few birds were observed at elevations above 1200 m, but no nests were found. We concluded that those birds may have been nonbreeders, or failed breeders, that may have moved to slightly higher elevations to forage.

5.2.1 The role of fire

Fire history explains much of the distribution of nesting Lewis's Woodpeckers. All of the breeding pairs found near Lake Windermere, Columbia Lake, and Lake Koocanusa were in areas that had burned repeatedly or severely, and relatively recently. For example, near Newgate, nesting pairs occurred in one of two types of habitats. Some nests were in burned forest where a few snags remained standing amidst wide open spaces.

Golf courses can provide breeding habitat for Lewis's Woodpeckers if suitable nest trees are available. This dead paper birch, at Fairmont, was used by one pair of Lewis's Woodpeckers in 1997. (Cameron Gillies photo).

These burnt snags are very fragile; one of the 1997 nesting sites, and several potential nest sites, have fallen or were knocked over between the 1997 and 1998 field seasons. The rest of the nest sites were in live ponderosa pines in very open stands or clumps which had obvious fire history (repeated quick fires that destroyed undergrowth but did not kill the mature trees).

Open ponderosa pine stands are extremely scarce in the East Kootenay Trench. They are naturally created through repeated low-intensity fires that occur every 5-20 years. For example, a site at Lake Koocanusa showed a mean fire interval of 6.8 years, and a site near Canal Flats showed a mean fire interval of 20.6 years (Daigle 1996). These fires burn surface debris, kill shrubs and

seedlings, thin out younger stands, burn off lower branches of larger trees, yet rarely kill larger trees. The result includes higher crowns, branchless trunks, more widely spaced and larger trees, open understories, and open space under the canopy, all features that seem to be preferred by nesting Lewis's Woodpeckers. Probably the best, and most perpetual, Lewis's Woodpecker nesting habitat in the study area was in the Strauss Wildlife Reserve near Newgate, where repeated fires have created the conditions described above. Many of the other areas with concentrations of nesting pairs (Dutch Creek Burn, Findlay Creek Burn, and parts of Newgate) are providing only temporary nesting habitat as nest trees are dead and will fall at some point in the near future, and regenerating forest will choke the open spaces.

There were three areas in the East Kootenay Trench which appeared suitable but where no Lewis's Woodpeckers were found. One puzzling result was the lack of nesting pairs found on the east side of Lake Koocanusa, directly across the lake from the area where many pairs nested. Although unused nest holes were found in live ponderosa pine in seemingly useable habitat, only one nest was found, and that in a small trembling aspen. Another area near Wasa contained two apparent nest cavities but no birds were seen in 1997 or 1998; this area was filling in with second growth. The age of a burn is a critical factor in its usefulness for Lewis's Woodpeckers. Burns less than 10 years and older than 40 years are likely of low use because of successional factors (Bock 1970).

Nesting Lewis's Woodpeckers may congregate in burns where a combination of very open habitat for foraging and standing wildlife trees for nest sites provide high quality breeding habitat. Burns tend to provide suitable habitat for 25-35, from a few years after the burn until wildlife trees fall over and a second-growth forest becomes established. This area, near Newgate, burned in 1970, was used by several pairs of Lewis's Woodpeckers in 1997 and 1998. (John M. Cooper photo)

It is possible that an area with suitable habitat may remain unoccupied for some time. For example, a burn along the lower foothills of the Wildhorse River, near Fort Steele appeared to offer very good habitat – hundreds of dead snags spread out over a large low elevation open area. The authors anticipated finding breeding pairs there but none were found in 1997 or 1998. The reason for a lack of Lewis's Woodpeckers at this burn is unknown.

The competing resource management issues of maintaining open ponderosa pine forest as wildlife habitat for those species that require that habitat versus the economic or human safety pressure to suppress the natural event (fire) that creates that habitat is a significant management paradox. In our opinion, fire suppression has significantly reduced the amount of available habitat in the East Kootenay Trench, and will continue to do so in the future. Although the issues are complex, resource managers must develop plans that allow the perpetuation of open ponderosa stands, or accept the risk that some wildlife species will decline significantly or disappear (Cooper and Gillies 1999).

5.2.2 Riparian habitat

Cannings et al. (1987) report that 44% of nests in the Okanagan valley were found in black cottonwoods, whereas in this study, only about 4% in black cottonwoods were found. In the Okanagan, that result was thought to be influenced by observer bias towards searching of riparian areas for nests. In the East Kootenays, conversely, observer bias favoured coniferous forest, as riparian areas were largely inaccessible. However, several apparently suitable stands of black cottonwoods (e.g., St. Mary River, Elk River, Bummers Flats (Fort Steele), Baynes Lake) were surveyed and nesting Lewis's Woodpeckers were found in only one stand. Although these results are scanty, it appears that few pairs nest in riparian black cottonwood stands in the East Kootenay.

5.3 Land Status

Most nests were found on Crown land, including the areas with relatively high concentrations of nesting pairs. Management of these areas could include consideration for Lewis's Woodpecker habitat, but many areas are managed mainly for other wildlife such as winter ungulate range and/or timber supply. Some management potential for habitat on private land also exists. Many of the largest remaining ponderosa pine snags in the East Kootenay Trench occur on private lands. Most landowners were quite pleased that a rare woodpecker was living on their property; therefore public education may be a useful method of encouraging landowners to retain important habitat features such as large, decayed ponderosa pines.

5.4 Conservation

Populations in the Dutch Creek Burn and near Wycliffe are probably the most threatened, but for different reasons. At Dutch Creek Burn, nesting birds are using mainly decadent snags left standing after the 1971 burn. These snags are in very soft condition and, at some point, will fall; in addition, regenerating forest will fill in the open spaces that the Lewis's Woodpecker require. At Wycliffe, most nests were found in very large veteran ponderosa pines, most of which were dead. One large dbh stump, which would have previously been a very good nest tree, but that had been felled for firewood, was aged at 350+ years. While these individual snags may stand for some time, they are exceedingly rare in the area, and are subject to cutting for firewood, to removal as possible danger trees (for those trees near buildings), and to removal for "aesthetic" reasons.

Once these trees fall, there are very few and, in many cases, no live and large ponderosa pines to take their place, as most large ponderosa pines have been removed previously; therefore pairs will either have to use alternate tree types or not nest in the area. For example, in 1997, the only large (dbh 67 cm) dead, veteran ponderosa pine found within about a 5 km radius, was home to the only nesting pair found in one area. Before the 1998 nesting season, this tree had been removed by the landowner. A single pair was again found in the same area in 1998. Although we can only speculate that it was the same pair, they nested in a trembling aspen, approximately 100 m from the 1997 nest tree. However, large dead ponderosa pines are expected to stand for many decades and can provide stable nest site habitat during that time, whereas decayed trembling aspens (those used for nesting by woodpeckers) are expected to stand for a much shorter period of time.

5.5 Summary

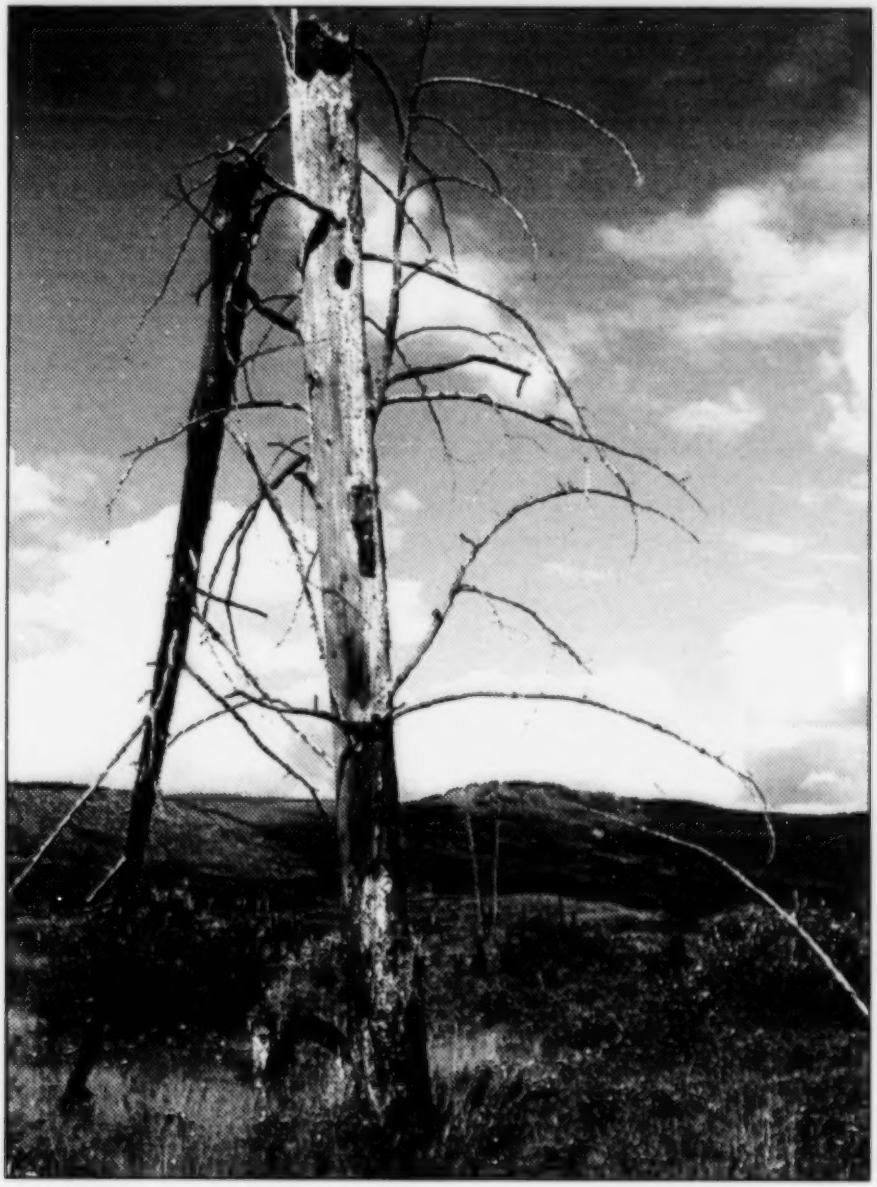
Some of the results reported here are similar to studies in other parts of the Lewis's Woodpecker range. These include a clumped distribution of nests in seemingly preferred habitat, nest tree characteristics that show a preference for large, dead or decayed trees, and nesting habitat occurring in open ponderosa pine forest, burned forest, and riparian cottonwood forest (Tobalske 1997, Linder

and Anderson 1998, Cooper et al. 1998). Burned ponderosa pine forest has been described as ideal habitat for breeding (Tobalske 1997). The results of this inventory project confirm this, but burned Douglas-fir stands are also readily used.

6 CONSERVATION RECOMMENDATIONS

6.1 General Recommendations

Existing stands of open mature ponderosa pine should be conserved, because of their rarity and their use by



The Durch Creek Burn contained several pairs of nesting Lewis's Woodpeckers in 1997 and 1998. Nests were mainly in remnant wildlife trees such as this broken Douglas-fir. Unlike ponderosa pines, only dead Douglas-firs are soft enough for the Lewis's Woodpecker to excavate cavities in. Standing wildlife trees in this area, burned in 1971 and 1985, are becoming increasingly rare as they age and fall over. Numbers of breeding pairs will likely decline as the number of wildlife trees declines. (Cameron Gillies photo).

Lewis's Woodpecker. Naturally occurring fire regimes in the PP and IDF biogeoclimatic zones should be encouraged and fires should not be suppressed. The long term result of fire suppression is to decrease the health of fire-dependent ecosystems by making areas more susceptible to stand-destroying fires, and by changing diversity of plants and animals that occur there. For Lewis's Woodpeckers, the primary result of fire suppression is negative, due to increased stem densities resulting from the encroachment of young Douglas-fir and ponderosa pine. Increased stem density reduces the "openness" of a stand, which is a vital habitat component required by this woodpecker.

- There is considerable potential for habitat enhancement through a combination of mechanical brushing of stands with mature stems which are "choked" with regeneration, then selective logging of some stems, and prescribed burning. Many hundreds of hectares could probably be enhanced by these methods. In the Invermere and Cranbrook Timber Supply Areas, there is an estimated 4700 ha of mature or older ponderosa pine, and only a few hundred ha could be currently classed as suitable habitat.
- Private landowners with high quality nest trees could be contacted and given educational material on the value of those trees, to prevent their premature cutting. Ideally, some form of recognition for protecting these valuable trees, should be given, perhaps through existing government habitat conservation programs.
- "Planting" of suitable snags in open habitats in the Ponderosa Pine and Interior Douglas-fir biogeoclimatic zones, where snags are absent, would likely attract nesting pairs. This technique is being used in some Forest Districts as a means to mitigate the loss of wildlife habitat for cavity-nesting birds and other species from areas that have been harvested. The greatest management potential for this technique is likely on privately-owned grasslands, where standing dead or decayed trees appear to be relatively rare compared to Crown lands.

6.2 Wildlife Habitat Areas

Three sites may qualify for WHA status (Province of B.C. 1999). At the Dutch Creek Burn, six nests in 1997 and five nests in 1998 are within 1000 m. This area is now a regenerating burn. Trees used for nesting are soft, remnant snags with a limited remaining life span before they fall down; therefore there seems to be little imperative to establish a WHA. Near Newgate, a cluster of five nests in 1997 and six nests in 1998, occur within 800 m, but again four are in remnant burned snags with a limited life span. In the Findlay Creek Burn, although there were relatively many pairs nesting, clusters of active nests in 1998 were not quite close enough to qualify as a WHA. It is likely that surveys in future years would find new nest trees, which added to trees used in 1998, may result in one or more areas meeting the minimum requirements for WHA designation.

One site near Newgate does not qualify for WHA status but because of its uniqueness could be considered. This is the single live tree with three active nests in 1997, and two nests plus an American Kestrel nest in 1998. The next two nearest Lewis's Woodpecker nest trees were 800 m and 1 km distant.

7 LITERATURE CITED

American Ornithologists' Union 1983. Check-list of North American birds. Am. Ornithol. Union, Lawrence, KS. 877pp.

Backhouse, F. 1993. Wildlife tree management in British Columbia. Wildl. Tree Comm. B.C. BC. Environ., Victoria, BC. 32pp.

B.C. Wildlife Branch. 1999. Birds, mammals, reptiles, and amphibians at risk in British Columbia: the 1999 Red and Blue Lists. B.C. Minist. Environ., Lands and Parks, Victoria, BC.

Bock, C.E. 1970. The ecology and behavior of the Lewis' Woodpecker (*Asyndesmus lewis*). Univ. Calif. Publ. in Zool. 92:1-100.

Campbell, R.W., N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser, and M.C.E. McNall. 1990. The birds of British Columbia – Diurnal birds of prey through woodpeckers. Royal B.C. Mus., Victoria, and Can. Wildl. Serv., Delta, BC. 636pp.

Cannings, R.A., R.J. Cannings, and S.G. Cannings. 1987. Birds of the Okanagan valley, British Columbia. Royal B.C. Mus., Victoria, BC. 420pp.

Cooper, J.M. 1992. Lewis's Woodpecker. Element ranking form, Conservation Data Centre, Victoria, BC.

Cooper, J.M., and C. Gillies. 1999. Breeding distribution of the Lewis's Woodpecker in the East Kootenay trench in relation to fire history. Paper presented to Symp. Biol. and Manage. of Species and Habitat at Risk, Kamloops, British Columbia, 15-19 February 1999.

Cooper, J.M., C. Siddle, and G. Davidson. 1998. Status of the Lewis's Woodpecker (*Melanerpes lewis*) in British Columbia. B.C. Minist. Environ., Lands and Parks, Wildl. Branch, Victoria, BC. Wildl. Working Rep. No. WR-91. 23pp.

Daigle, P. 1996. Fire in the dry interior forests of British Columbia. B.C. Minist. For., Victoria, BC. Extension Note 08. 5pp.

Lea, E.C., and A.P. Harcombe. 1992. Wildlife habitats of British Columbia. B.C. Minist. Environ., Lands and Parks, Wildl. Branch. Unpubl. rep. Victoria, BC. 5pp.

Linder, K.A., and S.H. Anderson. 1998. Nesting habitat of Lewis's Woodpeckers in southeastern Wyoming. J. Field Ornithol. 69:103-116.

Meidinger, D., and J. Pojar. 1991. Ecosystems of British Columbia. B.C. Minist. For., Victoria, BC. Spec. Rep. Ser. No. 6.

Ministry of Forests. 1998. Timber supply review, Nelson Forest Region. Electronic file. B.C. Minist. For., Victoria, BC.

Post, K., A. MacDonald and C. MacDonald. 1996. Wildlife trees in British Columbia. B.C. Minist. Environ., Lands and Parks, Victoria, BC. 104pp.

Province of British Columbia. 1995. Biodiversity guidebook. B.C. Minist. For. and Minist. Environ., Lands and Parks, Victoria, BC. 99pp.

Province of British Columbia. 1999. Identified wildlife management strategy. Forest Practices Code. B.C. Minist. Environ., Lands and Parks and Minist. For., Victoria, BC.

Sousa, P.J. 1983. Habitat suitability index models: Lewis's Woodpecker. U.S. Fish and Wildl. Serv., Washington, DC. 14pp.

Tobalske, B.W. 1997. Lewis's Woodpecker. *In* A. Poole and F. Gill, eds. The birds of North America, No. 284. Acad. Nat. Sci., Philadelphia, PA, and Am. Ornithol. Union, Washington, DC. 28pp.

Appendix 1. Key persons contacted for information on Lewis's Woodpeckers in the East Kootenay.

Ted Antifeau – MELP (Nelson)
Guy Burketts – Kootenay resident
Wayne Campbell – MELP (Victoria)
Peter Davidson – MELP (Cranbrook)
Neil Dawe – Canadian Wildlife Service
Robert Ferguson – Columbia Valley Naturalists
Donna Finnistad – Kootenay resident
Jo-Ellen Floor – MOF (Cranbrook)
Bob Forbes – MELP (Cranbrook)
Larry Halverson – Kootenay National Park
Rick Howie – MELP (Kamloops)
Larry Ingham – Columbia Basin FW Compensation Program (Invermere)
Bob Jamieson – Kootenay land use specialist
Ida Kale – BC Parks (Wasa)
Fran Kimpton – Kootenay biologist
Trevor Kinley – Kootenay biologist
Ian McTaggart-Cowan – Dean Emeritus, Graduate Studies, University of British Columbia
Ken Miles – knowledgeable resident (Wasa)
Nancy Newhouse – Kootenay biologist
Nadine Steele – Kootenay naturalist
Bill Swan – Columbia Valley Naturalists
Art Toomey – Kootenay naturalist
Bill Warkentin – MELP (Cranbrook)
Mildred White – Kootenay naturalist

Appendix 2. Poster that was placed in government offices, community billboards, etc.

WANTED

LEWIS' WOODPECKER

If you have seen this bird Phone: 1-250 812-7315 Toll Free

- ***Sightings*** *of birds or nests of this uncommon woodpecker are needed for a population study in the East Kootenay.*
- *The Lewis' Woodpecker nests in dead or decaying snags, mainly large ponderosa pines near grasslands, cottonwood groves along streams, and in burns.*
- *It is a colourful bird with a rosy belly, gray chest and neck, maroon face and greenish-black back.*

For further information and to report observations please call

John Cooper

Lewis' Woodpecker Hotline

1-259 812-7315

Appendix 3. Conservation Data Centre Field Observation Form (Animals).

CDC FIELD OBSERVATION FORM (ANIMALS) - Microsoft Internet Explorer

(To obtain a copy of this form, please print from your web browser)

B.C. Conservation Data Centre

FIELD OBSERVATION FORM (ANIMALS)

Complete *only for species on CDC tracking list. Information is not required for fields, but please fill out at least the fields in bold face.*

Species LENO 98N27

Name of recorder/reporter SUZANNE BEAUCHESNE

Address & phone # (250) 704-8797

Location *(be as precise as possible, preferably to within 100m; even very general information will be used, however)*
Wolf Creek Ridge

UTM grid reference (from blue grid on 1:50,000 NTS map): MAP GRID:

ZONE (e.g. 10U) 11 U **EASTING** 592200 **NORTHING** 5519900

Date:			Numbers: Adult:		Immature:			Notes:	Observ
year	month	day	Male	Female	Male	Female	Unkn.		
98	07	03	1	1			?	young could be h	
								in cavity in live	
								Aspen	

Evidence of Breeding

Habitat *(incl. dominant plants if possible; a general description of area)*
See EFF 98N27 ; riparian zone

Elevation 2750 metres (feet) (circle one) Slope 0 Aspect _____

Comments/Remarks (any additional information you can provide will be useful eg ac habitat disturbance or other threats, health or behaviour of animals, etc)

A third bird was in the area and may be assisting the pair in feeding

Our primary need is for location to be as precise as possible. A photocopy o topographic map, showing exact or approximate location would be appreciated, al necessary. You can indicate precision of location with the letters: S = radius; M = within 1 km; G = within about 10 km.

Please return forms to:

Conservation Data Centre
Ministry of Environment
780 Blanshard St.
Victoria, B.C. V8V 1X4

THANK YOU!

Appendix 4. Wildlife/Danger Tree Field Assessment Data form.

BRITISH COLUMBIA

WILDLIFE / DANGER TREE FIELD ASSESSMENT DATA

USE TO RECORD FIELD DATA FOR INDIVIDUAL TREE

ASSESSOR'S NAME | DATE Y M D

REGION | DISTRICT | LOCATION | T.S.A. | TSB | LICENCE NO. | LICENSEE | C.P. | BLOCK

SCOS / OPENING # / SETTING | PHOTO (line) Pt#

☐ Silviculture ☐ Roadside ☐ Treatment Unit Boundary ☐ Harvest ☐ Ground Vibration ☐ Heavy Equipment (specify) _____

WILDLIFE TREE #	SPECIES	WILDLIFE TREE CLASS	HAZARD A. Tree Defects	HAZARD B. Tree Lean	SOUNDNESS C. DBH (cm)	SOUNDNESS C. RBT (cm)	SOUNDNESS C. ABT (cm)	SOUNDNESS C. Structural Condition	SOUNDNESS D. Root Condition	OVERALL DANGER RATING	WILDLIFE TREE HABITAT RATING E. Tree Use Rating	F. Site Position	G. Decay Value	H. D.B.H. cm	H. D.B.H. Rating	I. HEIGHT m	I. HEIGHT Rating	J. Bark Condition	K. Wildlife Tree Use	WILDLIFE TREE VALUE	STRATUM	SAFETY PROCEDURES SAFE (RETAIN)	SAFETY PROCEDURES NO WORK ZONE	SAFETY PROCEDURES DANGEROUS (REMOVE)

W.L. TREE #	ADDITIONAL WILDLIFE TREE INFORMATION

FS 715-1 HSP 97/1

Appendix 5. Ecosystem Field Form.

BRITISH COLUMBIA — MINISTRY OF FORESTS, B.C. ENVIRONMENT

ECOSYSTEM FIELD FORM

PLOT NO. ~~98N17~~ 98N19 ~~98N172~~

DATE: Y 98 M 06 D 27 — SURVEYOR: BEAUCHESNE

PROJECT ID.:

SITE DESCRIPTION

LOCATION

GENERAL LOCATION: Wycliffe - South of small lake, W of airport

MAPSHEET	LATITUDE	LONGITUDE	MAP UNIT
			NA

AIR PHOTO NO.	X COORDINATE	Y COORDINATE
NA	585150	5495800

SITE INFORMATION

PLOT REPRESENTING:

BGC UNIT	SITE SERIES	ECOSECTION

ELEVATION	SLOPE	ASPECT	EXPOSURE
m	6° %	278 °	NA

MESO SLOPE POS.	SURFACE SHAPE	MOISTURE REGIME	NUTRIENT REGIME
US	ST		

SITE DISTURBANCE	SUCCESSIONAL STATUS	STRUCTURAL STAGE
B10-9		

SITE DIAGRAM

NA

PHOTO ROLL	FRAME NOS.

NOTES

horse and cattle graze here

SUBSTRATE

ORG. MATTER		ROCKS	
DEC. WOOD		MINERAL SOIL	X
BEDROCK		WATER	

FS 882(1) HRE 96/4

VEGETATION

STRATA COVERAGE: TREE 0 — SHRUB 5% — HERB 90% — MOSS • LICHEN — PLOT NO. — SURVEYOR — PAGE — OF

TREE LAYERS	A1	A2	A3	TOT%

SHRUB LAYERS	B1	B2
Snowberry (Symp-alb)		2
Prairie Rose (Ross-woo)		3

HERB LAYER	%
Yarrow (Achi-mil)	1
C. Dandelion (Tara-off)	1
Alfalfa (Medi-sat)	2
Purple Peavine (Lath-nev)	2
Common Hound's tongue (Cyno-off)	
Umber Pussytoes (Ante-umb)	
Showy Aster (Aste-con)	
Graceful Cinquefoil (Poti-gra)	
grass	

MOSS/LICHEN/SEEDLING	%

ADDITIONAL SPECIES	LAYER	%

FS 882(2) HRE 96/4

Appendix 6. Summary of Lewis's Woodpecker nest site general location, habitat, and nest tree characteristics, 1997.

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[1] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[2]	BGZ Variant	Slope	Status 1998
1	Wycliffe	5-Jun-97	82G12	940	E	PP	10.0	120	0	6	Dead	7.0	180	PP	PPdh	0	empty
2	Wycliffe	5-Jun-97	82G12	940	E	pole	8.0	30	0	n.d.[3]	n.d.	5.0	238	PP	PPdh	0	empty
3	Skookumchuck Prairie	8-Jun-97	82G12	790	E	pole	12.0	41	0	n.d.	n.d.	7.0	35	IDF	IDFdm	0	reused
4	Wycliffe	10-Jun-97	82G12	970	E	PP	17.0	71	n.d.	3	Dead	8.0	273	IDF	IDFdm	2	reused
5	Wycliffe	24-Jun-97	82G12	920	Y	PP	24.0	88	99	2	Dead	14.0	150	PP	PPdh	2	reused
6	Newgate	18-Jun-97	82G03	750	Y	DF	5.0	54	80	7	Dead	4.7	320	PP	PPdh	10	reused
7	Newgate	18-Jun-97	82G03	750	E	DF	2.4	31	90	7	Dead	1.9	120	PP	PPdh	10	fell: nest 5 m away
8	Newgate	18-Jun-97	82G03	750	E	DF	9.0	40	80	6	Dead	7.0	160	PP	PPdh	16	not reused: nest 10 m away
9	Newgate	18-Jun-97	82G03	750	Y	PP	24.0	46	100	1	Live	12.0	290	PP	PPdh	8	reused
10	Newgate	18-Jun-97	82G03	750	Y	DF	3.3	70	60	7	Dead	2.6	330	PP	PPdh	20	reused
11	Newgate	22-Jun-97	82G03	790	Y	PP	20.0	44	98	2	Live	10.0	312	PP	PPdh	3	reused
12	Newgate	22-Jun-97	82G03	790	Y	PP	20.0	44	98	2	Live	9.0	24	PP	PPdh	3	reused
13	Newgate	22-Jun-97	82G03	790	Y	PP	20.0	44	98	2	Live	7.5	160	PP	PPdh	3	occupied by American Kestrel
14	Newgate	19-Jun-97	82G03	760	Y	PP	18.0	34	100	1	Live	7.0	160	PP	PPdh	8	reused
15	Newgate	19-Jun-97	82G03	805	Y	PP	15.0	42	100	1	Live	6.0	280	PP	PPdh	22	reused
16	Wycliffe	25-Jun-97	82G12	920	Y	PP	28.0	110	90	3	Dead	12.0	174	PP	PPdh	2	reused
17	Wycliffe	20-Jun-97	82G12	940	Y	PP	18.0	99	50	3	Dead	6.0	108	PP	PPdh	0	reused
18	Wycliffe	18-Jun-97	82G12	940	Y	PP	16.0	69	0	4	Dead	12.0	162	PP	PPdh	20	not reused: nest 60 m away
19	Newgate	9-Jun-97	82G03	760	E	PP	20.0	39	100	1	Live	12.0	246	PP	PPdh	10	reused
20	Newgate	9-Jun-97	82G03	760	E	PP	16.0	34	100	2	Live	6.0	220	PP	PPdh	10	not successful in 1997: not reused in 1998
21	Newgate	26-Jun-97	82G03	770	Y	PP	14.0	52	100	1	Live	8.0	178	PP	PPdh	5	reused

[1] WLT = Wildlife Tree Class
[2] BGZ = Biogeoclimatic Zine
[3] n.d. = no data available

Appendix 6. (continued)

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[1] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[2]	BGZ Variant	Slope	Status 1998
22	Newgate	28-Jun-97	82G03	790	E	PP	15.0	43	100	2	Live	6.0	230	PP	PPdh	0	reused
23	Newgate	28-Jun-97	82G03	760	Y	PP	5.0	53	80	7	Dead	2.5	206	PP	PPdh	0	not reused: nest may have been predated by bears in 1998
24	Newgate	28-Jun-97	82G03	760	Y	PP	12.0	58	80	4	Dead	11.6	298	PP	PPdh	2	could not confirm use, although it seemed very probable
25	Ta Ta Creek	21-Jun-97	82G13	780	Y	PP	25.0	67	10	3	Dead	19.0	268	IDF	IDFdm		nest tree cut down: Lewis's Woodpecker pair in nearby trembling aspen
26	Wycliffe	26-Jun-97	82G12	920	Y	PP	25.0	n.d.	n.d.	3	Dead	n.d.	n.d.	IDF	IDFdm	0	both adults found dead: cavity not reused
27	Ta Ta Creek	28-Jun-97	82G13	780	Y	PP	15.0	91	60	2	Live	9.0	355	IDF	IDFdm	0	not reused
28	Wasa, Wolf Creek	30-Jun-97	82G13	850	Y	PP	9.0	54	99	2	Live	5.5	318	PP	PPdh	0	reused
29	Baynes L. turnoff burn	1-Jul-97	82G06	850	Y	DF	11.0	46	70	6	Dead	8.0	280	IDF	IDFdm	19	not reused (2 nests < 1km away)
30	St. Marys Reserve	4-Jul-97	82G12	790	Y	BC	n.d.	n.d.	n.d.	n.d.	Live	n.d.	n.d.	PP	PPdh		reused
31	St. Marys Reserve	4-Jul-97	82G12	790	Y	BC	n.d.	n.d.	n.d.	n.d.	Live	n.d.	n.d.	PP	PPdh		tree fallen or cleared for development
32	Fairmont	6-Jun-97	82J05	810	E	PB	12.0	30	98	6	Dead	8.0	235	IDF	IDFdm	0	not reused
33	Fairmont	6-Jun-97	82J05	810	E	BC	20.0	66	95	2	Live	10.0	90	IDF	IDFdm	0	not reused
34	Fairmont	6-Jun-97	82J05	810	E	BC	24.0	50	99	3	Dead	11.0	70	IDF	IDFdm	0	reused
35	Fairmont	13-Jun-97	82J05	810	E	PB	11.0	66	95	2	Live	5.0	110	IDF	IDFdm	0	reused
36	Dutch Creek burn	14-Jun-97	82J05	820	E	TA	18.0	28	99	1	Live	7.0	200	IDF	IDFdm	0	not reused
37	Dutch Creek burn	14-Jun-97	82J05	820	E	DF	12.0	35	10	4	Dead	4.2	90	IDF	IDFdm	30	not reused
38	Canal Flats/Findlay Cr	16-Jun-97	82J04	850	E	PP	7.5	36	90	4	Dead	3.2	130	IDF	IDFdm	24	reused

Appendix 6. (continued)

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[1] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[2]	BGZ Variant	Slope	Status 1998
39	Canal Flats/Findlay Cr	2-Jul-97	82J04	1070	E	PP	7.5	60	80	6	Dead	6.7	290	IDF	IDFdm	0	not reused
40	Dutch Creek burn	3-Jul-97	82J05	840	Y	DF	5.5	29	15	6	Dead	4.2	70	IDF	IDFdm	5	reused
41	Dutch Creek burn	3-Jul-97	82J05	820	Y	DF	9.0	35	80	4	Dead	4.0	100	IDF	IDFdm	18	reused
42	Dutch Creek burn	3-Jul-97	82J05	820	Y	TA	6.0	24	90	6	Dead	5.5	220	IDF	IDFdm	0	not reused
43	Dutch Creek burn	3-Jul-97	82J05	810	Y	DF	6.5	51	1	7	Dead	6.0	50	IDF	IDFdm	18	reused
44	Dutch Creek burn	3-Jul-97	82J05	840	Y	DF	13.0	71	20	5	Dead	10.0	110	IDF	IDFdm	8	not reused
45	Lavington Creek	30-Jun-97	82J04	1100	E?	PP	22.0	68	80	2	Live	18.0	10	IDF	IDFdm	8	not reoccupied
46	Dutch Creek burn	3-Jul-97	82J05	810	Y	TA	20.0	32	99	3	Dead	13.0	10	IDF	IDFdm	10	not reoccupied
47	Dutch Creek burn	3-Jul-97	82J05	820	Y	DF	8.0	60	20	7	Dead	7.0	30	IDF	IDFdm	16	reused

Appendix 7. Summary of Lewis's Woodpecker nest site general location, habitat, and nest tree characteristics, 1998.

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[3] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[4]	BGZ Variant	Slope	1997 Status (97 nest #)	Land Status
1	Wycliffe	22-Jun-98	82G12	920	Y	PP	28.0	110	90	3	Dead	14.0	66	PP	PPdh	2	Tree (16)	P
2	Wycliffe	22-Jun-98	82G12	920	E	PP	24.0	88	99	2	Live	14.0	150	PP	PPdh	2	Cavity (5)	P
3	Newgate	23-Jun-98	82G03	750	3Y	DF	2.0	28	90	7	Dead	1.7	20	PP	PPdh	10	5m from (7)	C
4	Newgate	23-Jun-98	82G03	750	E	DF	3.3	70	60	7	Dead	2.5	90	PP	PPdh	20	Tree (10)	C
5	Newgate	23-Jun-98	82G03	750	Y	DF	5.0	54	80	7	Dead	4.7	320	PP	PPdh	10	Cavity (6)	C
6	Newgate	23-Jun-98	82G03	750	Y	DF	3.5	28	95	7	Dead	3.2	18	PP	PPdh	10	3m from (8)	C
7	Newgate	23-Jun-98	82G03	750	E	DF	6.0	48	95	7	Dead	2.0	96	PP	PPdh	0	Unknown	C
8	Newgate	23-Jun-98	82G03	750	Y	PP	17.0	46	100	1	Live	10.0	140	PP	PPdh	0	Unknown	C
9	Newgate	23-Jun-98	82G03	750	?	PP	17.0	46	100	1	Live	11.5	140	PP	PPdh	0	Unknown	C
10	Newgate	23-Jun-98	82G03	790	Y	PP	20.0	44	98	2	Live	10.0	312	PP	PPdh	3	Cavity	C
11	Newgate	23-Jun-98	82G03	790	Y	PP	20.0	44	98	2	Live	9.0	24	PP	PPdh	3	Cavity	C
12	Skookumchuck Prairie	24-Jun-98	82G12	790	Y	PP	2.4	42	98	7	Dead	2.0	125	IDF	IDFdm	0	Unknown	P
13	Skookumchuck Prairie	24-Jun-98	82G12	790	E	pole	12.0	41	0	n/a	n/a	7.0	35	IDF	IDFdm	0	Cavity (3)	C
14	Wycliffe	26-Jun-98	82G12	940	Y	PP	18.0	99	50	3	Dead	6.0	108	PP	PPdh	0	Cavity (17)	P
15	Wycliffe	26-Jun-98	82G12	940	3Y	DF	1.6	40	95	7	Dead	0.6	74	PP	PPdh	0	60m from (18)	P
16	Wycliffe	26-Jun-98	82G12	970	E	PP	17.0	71	100	3	Dead	8.5	272	IDF	IDFdm	2	Tree (4)	P
17	Wycliffe	22-Jun-98	82G12	930	Y	PP	16.0	115	95	3	Dead	14.0	98	IDF	IDFdm	6	Unknown	P
18	Newgate	28-Jun-98	82G03	770	Y	PP	14.0	52	100	1	Live	8.0	178	PP	PPdh	5	Cavity (21)	C
19	Newgate	28-Jun-98	82G03	750	Y	PP	24.0	46	100	1	Live	12.0	290	PP	PPdh	8	Cavity (9)	C
20	Ta Ta Creek	29-Jun-98	82G13	780	Y	TA	14.0	32	100	2	Live	10.0	298	IDF	IDFdm	0	100m from cut (25)	P
21	Wasa	29-Jun-98	82G13	820	Y	PP	20.0	90	90	4	Dead	10.0	270	PP	PPdh	45	Unknown	C
22	Wasa	29-Jun-98	82G13	820	Y	PP	12.0	45	85	5	Dead	11.7	40	PP	PPdh	0	Unknown	P
23	south of Wycliffe	30-Jun-98	82G12	790	Y	PP	20.0	84	95	3	Dead	15.0	180	PP	PPdh	20	Unknown	P
24	Wycliffe	2-Jul-98	82G12	1050	Y	PP	24.0	73	99	1	Live	14.0	270	PP	PPdh	5	Unknown	P
25	Wycliffe	2-Jul-98	82G12	1050	Y	pole	16.0	41	0	n/a	n/a	14.0	280	PP	PPdh	0	Unknown	P
26	Skookumchuck Prairie	3-Jul-98	82G12	780	Y	PP	20.0	80	95	3	Dead	4.0	12	IDF	IDFdm	0	Unknown	P
27	Wasa, Wolf Creek	3-Jul-98	82G13	840	Y	TA	15.0	44	100	1	Live	5.0	280	PP	PPdh	0	Unknown	P

[3] WLT = Wildlife Tree Class

[4] BGZ = Biogeoclimatic Zine

Appendix 7. (continued)

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[1] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[2]	BGZ Variant	Slope	1997 Status (97 nest #)	Land Status
28	Wasa, Wolf Creek	3-Jul-98	82G13	850	Y	PP	9.0	54	99	2	Live	5.5	318	PP	PPdh	0	Cavity (28)	C
29	St. Mary's Mission	10-Jul-98	82G12	790	Y	BC	20.0	109	99	2	Live	6.0	200	PP	PPdh	0	Cavity (30)	P
30	Baynes L. turnoff burn	5-Jul-98	82G03	850	Y	DF	10.0	48	95	4	Dead	3.0	140	IDF	IDFdm	2	Unknown	C
31	Baynes L. turnoff burn	5-Jul-98	82G03	850	E	TA	10.0	38	100	2	Live	5.0	198	IDF	IDFdm	0	Unknown	C
32	Newgate	6-Jul-98	82G03	760	Y	PP	20.0	39	100	1	Live	12.0	246	PP	PPdh	10	Cavity (19)	C
33	Newgate	6-Jul-98	82G03	790	Y	PP	15.0	43	100	2	Live	6.0	230	PP	PPdh	0	Cavity (22)	C
34	Newgate	6-Jul-98	82G03	805	E	PP	15.0	42	100	1	Live	6.0	280	PP	PPdh	22	Cavity (15)	C
35	Newgate	6-Jul-98	82G03	760	Y	TA	10.0	48	100	1	Live	2.5	130	PP	PPdh	5	Unknown	C
36	Newgate	6-Jul-98	82G03	760	Y	PP	18.0	34	100	1	Live	7.0	160	PP	PPdh	8	Cavity (14)	C
37	Newgate	6-Jul-98	82G03	760	Y	TA	4.5	23	100	2	Live	3.5	250	PP	PPdh	8	Unknown	C
38	Elk Forest	8-Jul-98	82G03	790	Y	TA	10.0	20	100	2	Live	2.5	176	PP	PPdh	0	Unknown	C
39	Wigwam River ridge	9-Jul-98	82G06	1160	Y	DF	14.0	49	0	7	Dead	11.0	106	IDF	IDFdm	2	Unknown	C
40	Newgate	9-Jul-98	82G03	760	Y	DF	3.5	55	50	6	Dead	1.0	60	PP	PPdh	0	Unknown	C
41	Wycliffe	11-Jul-98	82G12	1070	3Y	DF	14.0	77	98	2	Live	10.0	140	PP	PPdh	0	Unknown	P
42	Fairmont	12-Jun-98	82J05	810	E	BC	24.0	50	99	3	Dead	11.0	70	IDF	IDFdm	0	Cavity (34)	P
43	Fairmont	12-Jun-98	82J05	810	E	PB	11.0	66	95	2	Live	5.0	110	IDF	IDFdm	0	Cavity (35)	P
44	Canal Flats/Findlay Cr	30-Jun-98	82J04	850	Y	PP	7.5	36	90	4	Dead	3.2	130	IDF	IDFdm	24	Cavity (38)	C
45	Dutch Creek burn	22-Jun-98	82J05	840	E	DF	5.5	29	15	6	Dead	4.2	70	IDF	IDFdm	5	Cavity (40)	C
46	Dutch Creek burn	22-Jun-98	82J05	820	Y	DF	9.0	35	80	4	Dead	4.0	100	IDF	IDFdm	18	Cavity (41)	C
47	Dutch Creek burn	23-Jun-98	82J05	810	Y	DF	6.5	51	1	7	Dead	6.0	50	IDF	IDFdm	18	Cavity (43)	C
48	Dutch Creek burn	23-Jun-98	82J05	820	Y	DF	8.0	60	20	7	Dead	7.0	30	IDF	IDFdm	16	Cavity (47)	C
49	Fairmont	12-Jun-98	82J05	810	E	PB	11.0	46	99	2	Live	8.0	220	IDF	IDFdm	0	Unknown	P
50	Fairmont	12-Jun-98	82J05	810	E	PB	12.0	34	99	2	Live	9.0	140	IDF	IDFdm	0	Unknown	P
51	Fairmont	12-Jun-98	82J05	810	E	BC	22.0	54	99	2	Live	18.0	250	IDF	IDFdm	0	Unknown	P
52	Fairmont	12-Jun-98	82J05	810	E	PB	14.0	44	98	6	Dead	9.0	180	IDF	IDFdm	0	Unknown	P
53	Canal Flats/Findlay Cr	30-Jun-98	82J04	820	Y	PP	13.5	80	95	6	Dead	13.0	330	IDF	IDFdm	40	Unknown	C
54	Canal Flats/Findlay Cr	30-Jun-98	82J04	960	Y	pole	19.0	50	0	n/a	n/a	9.0	300	IDF	IDFdm	5	Unknown	C
55	Canal Flats/Findlay Cr	30-Jun-98	82J04	980	E	WL	19.0	58	0	5	Dead	18.0	310	IDF	IDFdm	4	Unknown	C
56	Canal Flats/Findlay Cr	1-Jul-98	82J04	910	Y	PP	8.0	50	95	7	Dead	5.5	100	IDF	IDFdm	12	Unknown	C
57	Canal Flats/Findlay Cr	1-Jul-98	82J04	900	Y	DF	8.5	54	99	7	Dead	8.0	190	IDF	IDFdm	12	Unknown	C

Appendix 7. (continued)

Nest #	Location	Date	Map Grid	Elev. m	Eggs/ Young	Tree sp.	Tree ht. m	Tree dbh cm	Bark %	WLT[1] Class	Dead/ Live	Cavity ht. (m)	Cavity orient.	BGZ[2]	BGZ Variant	Slope	1997 Status (97 nest #)	Land Status
58	Canal Flats/Findlay Cr	1-Jul-98	82J04	950	E	PP	6.0	46	50	7	Dead	5.0	230	IDF	IDFdm	10	Unknown	C
59	Canal Flats/Findlay Cr	3-Jul-98	82J04	980	Y	PP	25.0	46	15	4	Dead	13.0	40	IDF	IDFdm	13	Unknown	C
60	Canal Flats/Findlay Cr	3-Jul-98	82J04	1010	Y	PP	8.0	43	70	7	Dead	6.5	160	IDF	IDFdm	16	Unknown	C
61	Canal Flats/Findlay Cr	3-Jul-98	82J04	1010	Y	DF	6.0	37	95	7	Dead	4.5	210	IDF	IDFdm	22	Unknown	C
62	Canal Flats/Findlay Cr	3-Jul-98	82J04	1010	Y	PP	?	59	59	4	Dead	?	110	IDF	IDFdm	8	Unknown	C
63	Canal Flats/Findlay Cr	3-Jul-98	82J04	1010	Y	DF	12.0	48	25	4	Dead	5.5	80	IDF	IDFdm	15	Unknown	C
64	Dutch Creek burn	6-Jul-98	82J05	820	Y	DF	5.0	34	34	7	Dead	3.5	250	IDF	IDFdm	16	Unknown	C
65	Dutch Creek burn	7-Jul-98	82J05	840	Y	DF	20.0	51	1	5	Dead	13.0	340	IDF	IDFdm	29	Unknown	C
66	Dutch Creek burn	7-Jul-98	82J05	820	Y	DF	10.0	83	15	7	Dead	4.0	310	IDF	IDFdm	20	Unknown	C
67	Canal Flats/Findlay Cr	8-Jul-98	82J04	920	Y	WL	5.0	44	95	7	Dead	3.3	70	IDF	IDFdm	5	Unknown	C
68	Canal Flats/Findlay Cr	10-Jul-98	82J04	1110	Y	WL	16.0	39	75	6	Dead	15.0	150	IDF	IDFdm	10	Unknown	C
69	Canal Flats/Findlay Cr	10-Jul-98	82J04	1040	E	DF	19.0	65	90	6	Dead	18.5	100	IDF	IDFdm	9	Unknown	C
70	Canal Flats/Findlay Cr	13-Jul-98	82J04	1020	Y	PP	8.0	36	90	6	Dead	5.0	230	IDF	IDFdm	6	Unknown	C
71	Canal Flats/Findlay Cr	13-Jul-98	82J04	1010	Y	PP	5.5	47	30	7	Dead	5.0	260	IDF	IDFdm	14	Unknown	C
72	Canal Flats/Findlay Cr	13-Jul-98	82J04	1010	Y	DF	9.5	42	90	6	Dead	4.5	100	IDF	IDFdm	4	Unknown	C
73	Canal Flats/Findlay Cr	8-Jul-98	82J04	960	Y	DF	7.0	31	99	6	Dead	4.5	160	IDF	IDFdm	20	Unknown	C
74	Canal Flats/Findlay Cr	8-Jul-98	82J04	940	Y	?	12.0	35	0	6	Dead	11.5	330	IDF	IDFdm	8	Unknown	C
75	Canal Flats/Findlay Cr	13-Jul-98	82J04	950	Y	DF	6.0	39	80	7	Dead	2.5	150	IDF	IDFdm	7	Unknown	C
76	Canal Flats/Findlay Cr	13-Jul-98	82J04	910	Y	PP	13.0	63	99	4	Dead	9.0	290	IDF	IDFdm	5	Unknown	C
77	Canal Flats/Findlay Cr	13-Jul-98	82J04	910	Y	DF	13.0	48	85	6	Dead	12.0	310	IDF	IDFdm	8	Unknown	C
78	Canal Flats/Findlay Cr	14-Jul-98	82J04	1010	Y	DF	11.0	47	95	6	Dead	10.7	40	IDF	IDFdm	20	Unknown	C
79	Canal Flats/Findlay Cr	14-Jul-98	82J04	990	Y	PP	9.0	54	99	6	Dead	8.5	90	IDF	IDFdm	12	Unknown	C
80	Canal Flats/Findlay Cr	14-Jul-98	82J04	1040	Y	PP	18.0	62	40	6	Dead	17.5	90	IDF	IDFdm	12	Unknown	C
81	Canal Flats/Findlay Cr	14-Jul-98	82J04	1040	Y	DF	8.5	52	99	7	Dead	8.2	80	IDF	IDFdm	0	Unknown	C
82	Canal Flats/Findlay Cr	15-Jul-98	82J04	980	Y	DF	11.0	54	99	7	Dead	10.7	230	IDF	IDFdm	0	Unknown	C
83	Canal Flats/Findlay Cr	15-Jul-98	82J04	1010	Y	DF	7.5	52	25	7	Dead	7.0	210	IDF	IDFdm	18	Unknown	C
84	Canal Flats/Findlay Cr	15-Jul-98	82J04	940	Y	DF	8	40	99	7	Dead	7.7	20	IDF	IDFdm	0	Unknown	C
85	Canal Flats/Findlay Cr	16-Jul-98	82J04	1020	Y	?	18	45	0	6	Dead	16.0	90	IDF	IDFdm	10	Unknown	C

Wildlife Working Reports may be cited, but the preliminary nature of the data they contain should be noted. Working Reports 1-39 (and certain others) are presently out of print, but photocopies may be available through the Wildlife Branch, Ministry of Environment, Lands and Parks or other agencies. Titles of Working Reports 1-39 are available on request.

WR-40 Wolf-prey dynamics. Proceedings of a symposium sponsored by B.C. Ministry of Environment, Wildlife Branch, Faculty of Forestry, University of British Columbia and the Northwest Wildlife Preservation Society. February 1989. 188pp.

WR-41 Caribou research and management in B.C.: proceedings of a workshop. R. Page, ed. November 1988. 275pp. (Also printed as WHR-27)

WR-42 Trapping in British Columbia - a survey. R. Reid. January 1989. 55pp.

WR-43 Biophysical habitat units of the Lower Halfway study area: expanded legend. E.C. Lea and L.E.H. Lacelle. December 1989. 33pp.

WR-44 Long range habitat planning: proceedings. M. Fenger and V. Stevens, eds. March 1990. 49pp.

WR-45 Biophysical habitat units of the Mosley Creek study area: expanded legend and interpretations. E.C. Lea and R.C. Kowall. March 1990. 33pp.

WR-46 Habitat Management Section. Annual General Meeting. Yellowpoint Lodge - 1989 April 25-27. Wildlife and Recreational Fisheries Branches, Ministry of Environment. July 1990. 107pp.

WR-47 Working plan — Khutzeymateen Valley grizzly bear study. A.N. Hamilton and J.A. Nagy. September 1990. 35pp. (Also printed as WHR-28).

WR-48 Khutzeymateen Valley grizzly bear study. Annual progress report - year 1 (1989/90), annual working plan - year 2 (1990/91). J.A. Nagy and A.G. MacHutchon. January 1991. 44pp. (Also printed as WHR-29).

WR-49 Fort Nelson and area average winter maximum snowpack mapping. R. Chilton. July 1990. 12pp.

WR-50 Marten habitat suitability research project - working plan. E.C. Lofroth and V. Banci. January 1991. 31pp.

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